



REQTIFY
CONNECTING THE DOTS BETWEEN
REQUIREMENTS MANAGEMENT,
MODELING, SIMULATION, TESTS &
CAD SOLUTIONS, TO ESTABLISH
END-TO-END TRACEABILITY.



3DEXPERIENCE®

Reine GROS



REINE GROS

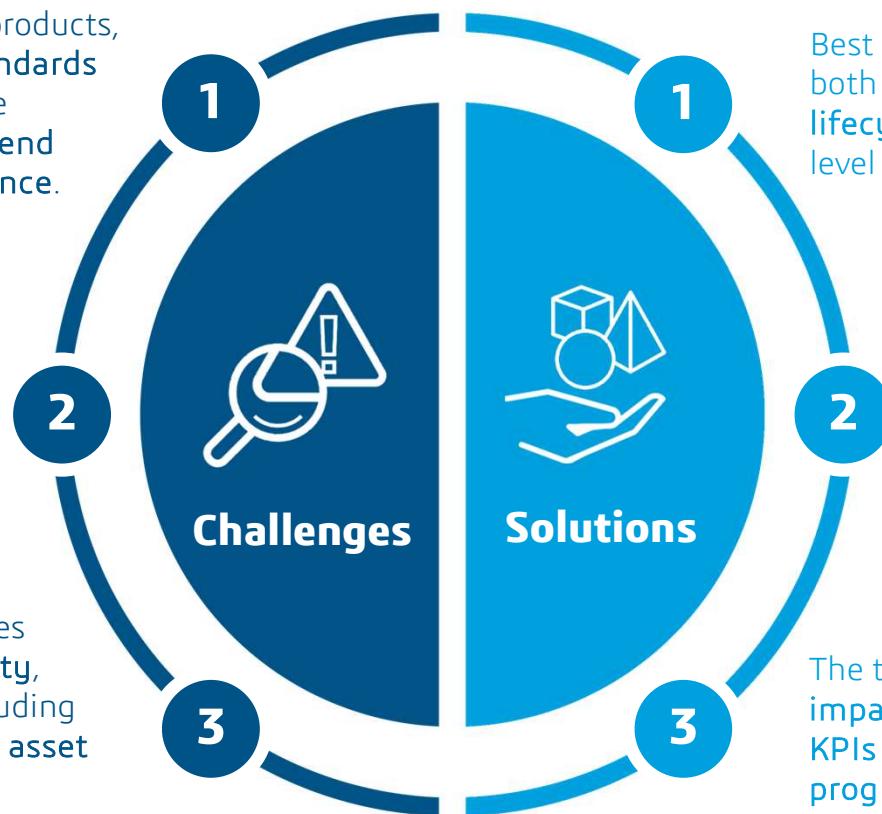
- I got my **Engineering degree in 2001** from ENSEM (Ecole Nationale Supérieur d'Electricité et de Mécanique) in Nancy, East of France.
- I begin as **application engineer** and then as **project manager** on **ControlBuild** tool for **Railway projects**.
- Since 2014, I work on **System Engineering** in **CATIA Cyber Systems** team.
- I'm specialized in **Requirement Engineering** around tools as **Reqtify** and **3DEXPERIENCE** platform apps such as **Requirement Management, System Traceability and Report Generation**.

CHALLENGES VS REQTIFY SOLUTIONS

The growing complexity of new products, along with the ever-changing standards and regulations, has increased the difficulty of implementing end to end traceability and ensuring compliance.

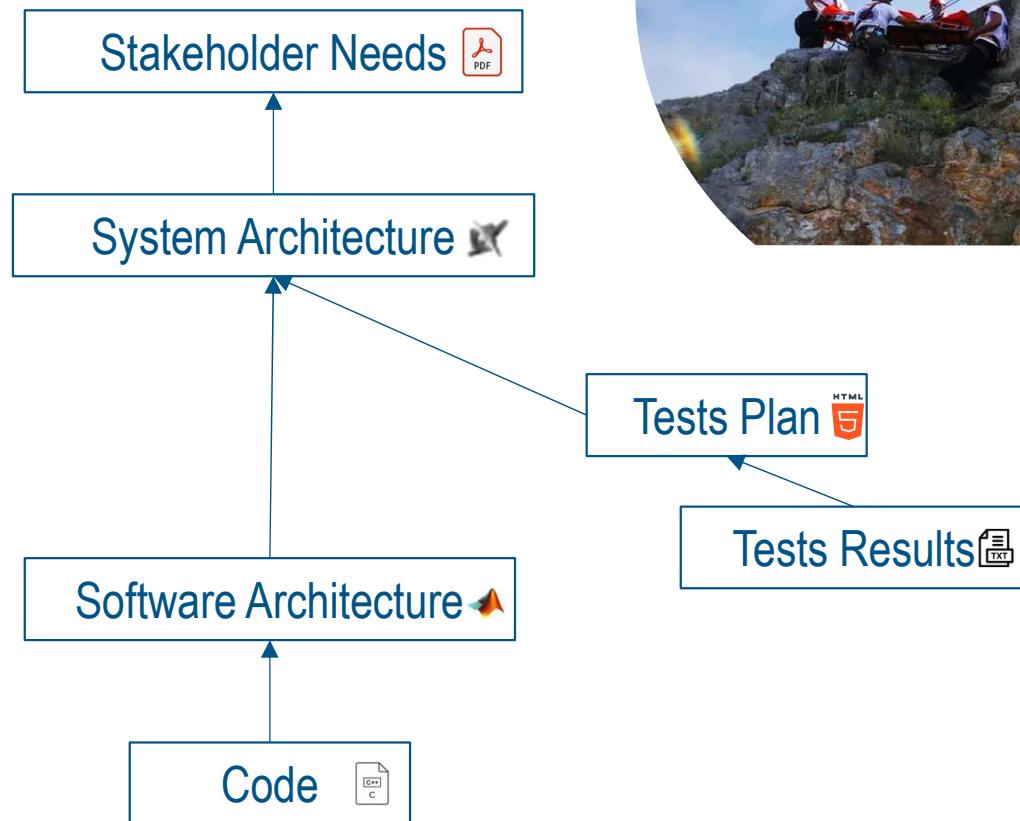
The diversity of processes and associated IT tools constitutes an obstacle to the effective implementation of traceability.

Limited impact analysis capabilities hinder the perception of traceability, limiting it to being seen as a concluding project task rather than a valuable asset for improving product quality and reliability.



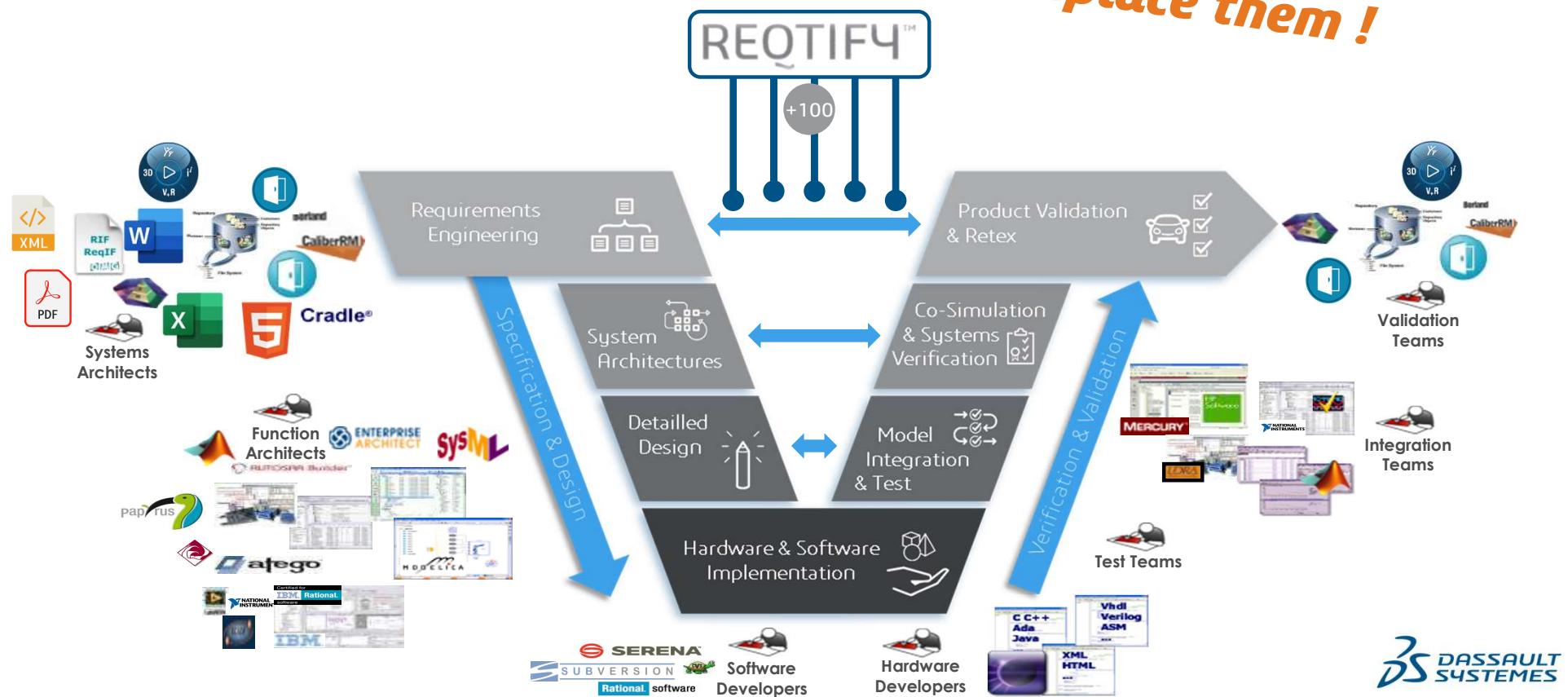
SAFETY AND RESCUE USE CASE PRESENTATION

- How to manage traceability in such a project?
- How to synchronize Requirements or Needs into CATIA Magic when no DataHub solution is available ?
- What is the impact of a change in Stakeholder needs?
- Which element are impacted by a Failed Test?

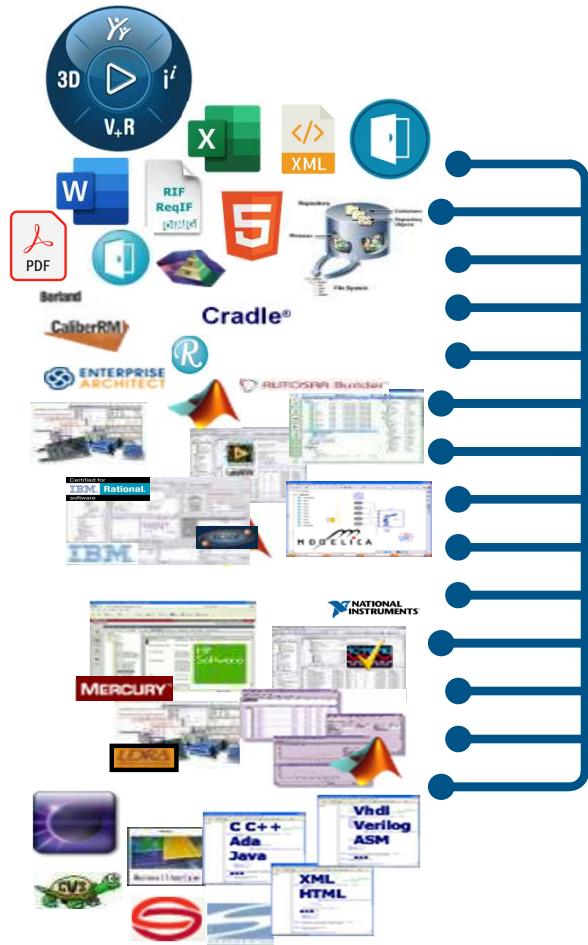


THE SOLUTION

Connect your tools ! Does not replace them !

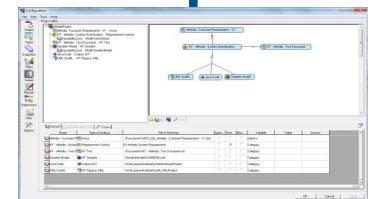


HOW DOES IT WORK ?



Intelligent Data
Mapping

REQTIFY™



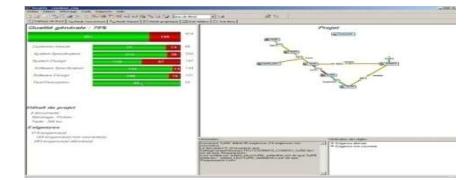
Project Configuration



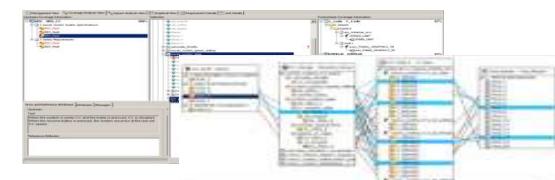
Im-/Export Capabilities



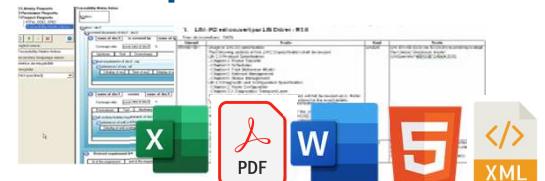
Project Dashboarding



Traceability/Impact Analysis



Report Generation



*Doors NG : Reqify only supports links creation at the moment

STAKEHOLDER NEEDS FOR SAR DRONE

Menu STK Needs for SAR Dron... Find text or tools PDF

All tools Edit Convert E-Sign

May, 2024

Stakeholder Needs for Search And Rescue Drone

| Table of Contents | |
|------------------------------|---|
| 1. <i>User Needs</i> | 3 |
| 2. <i>Design Constraints</i> | 4 |

1. User Needs
STK-SAR-001 Search Pattern
The drone must be able to fly over the SAR zone by selected pattern.
#Criticality: Medium

STK-SAR-002 Self-Guided
Given the location, the drone must be able to reach the SAR zone unmanned.
#Criticality: High

STK-SAR-003 First Aid & Survival Kit
When found, a person in distress shall be provided with medicine, water, and some food.
#Criticality: High

STK-SAR-004 Climate
The drone must be able to fly in any weather conditions.
#Criticality: Medium

STK-SAR-005 Human Recognition
The drone must be able to recognize humans and distinguish them from other living things.
#Criticality: Low

STK-SAR-006 Communication
The drone must be able to communicate with some mobile center (send its location, get control if needed, get the location for landing, provide the person in distress location).
#Criticality: Low

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SYSTEM ARCHITECTURE FOR SAR DRONE

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File Edit View Layout Diagrams Options Tools Analyze Collaborate 3DEXPERIENCE Window Help

Containment

1 Problem Domain

1 Black Box

1 Stakeholder Needs

Stakeholder Needs for SAR

Stakeholder Needs for SAR

2 System Context

Relations

1 Users & Other Systems

Drone in SAR Mission

3 Use Cases

Relations

Use Cases of the Drone in SAR

Search for Persons in Distress

4 Measures of Effectiveness

2 White Box

2 Conceptual Subsystems

3 Functional Analysis

Relations

Accept Flight Guidance

Analyze Visual Data

Calculate Itinerary

Capture the Person in Distress

Drop the FA&S Kit to the Person

Fly Back to the Platform

Fly to the SAR Zone

Issue a Request to Drop the FA&S Kit

Issue a Request to Fly Close to the Person in Distress

Land on the Platform

Provide Flight Guidance

Provide the Person in Distress

Receive the Command to Fly

Receive the Mission Data

Receive the Platform Location

Receive the Request to Drop the FA&S Kit

Receive the Request to Fly

Scan the Environment

Search for a Person in Distress

Take Off the Platform

4 MoEs for Subsystems

Index

Selection

Tools

Common

Note

Text Box

Anchor

Containment

Dependency

Image From...

Diagram Overview

Legend

Constraint

Horizontal Se...

Content Diagram

Content Shape

Package

Create Diagram

Presentation Fi...

MagicGrid Project: Search Drone

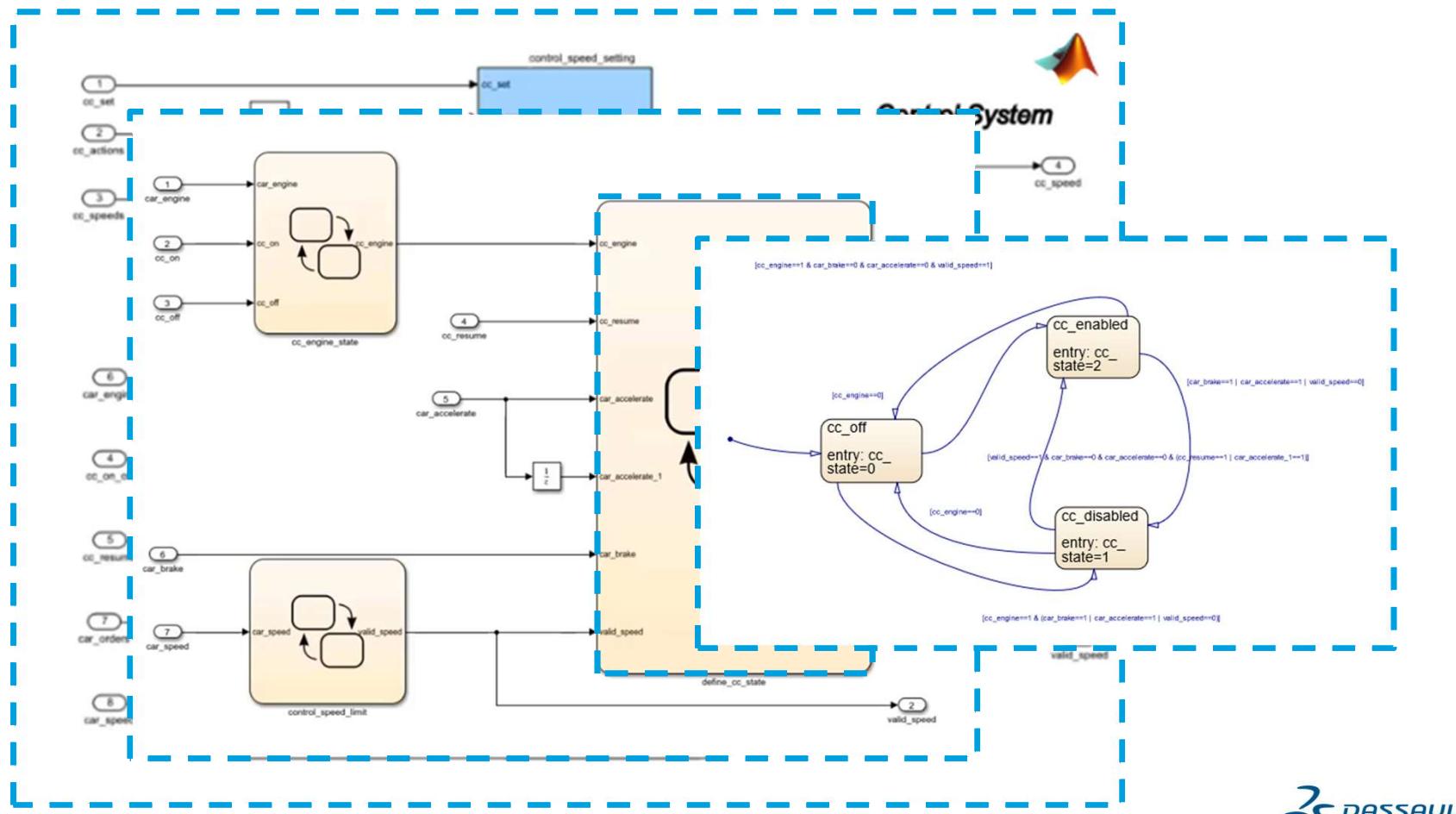
PILLAR

| | REQUIREMENTS | STRUCTURE | BEHAVIOR | PARAMETERS | |
|---------------|-------------------------------|--|---|---|---|
| DOMAIN | PROBLEM (BLACK BOX) | Stakeholder Needs  Stakeholder Needs for SAR Drone  RC Stakeholder Needs for SAR Drone  Problem Domain to Stakeholder Needs | System Context  Drone in SAR Mission | Use Cases  Use Cases of the Drone in SAR Mission  Search for Persons in Distress within a SAR Zone | Measures of Effectiveness  Measures of Effectiveness of SAR Drone |
| | PROBLEM (WHITE BOX) |  Conceptual Subsystems  SAR Drone Internal Communications  WB Functions to Structure | Functional Analysis  Functional Decomposition  A |  Fly to the SAR Zone  Search for a Person in Distress |  MoEs for Subsystems  MoEs for Subsystems of SAR Drrones  Total Mass of Search Drone |
| | SOLUTION |  System Requirements for Search Drone  Systems Requirements to Problem Domain Subsystem Requirements | System Structure | System Behavior | System Parameters |
| | Component Requirements | Component Structure | Component Behavior | Component Parameters | |

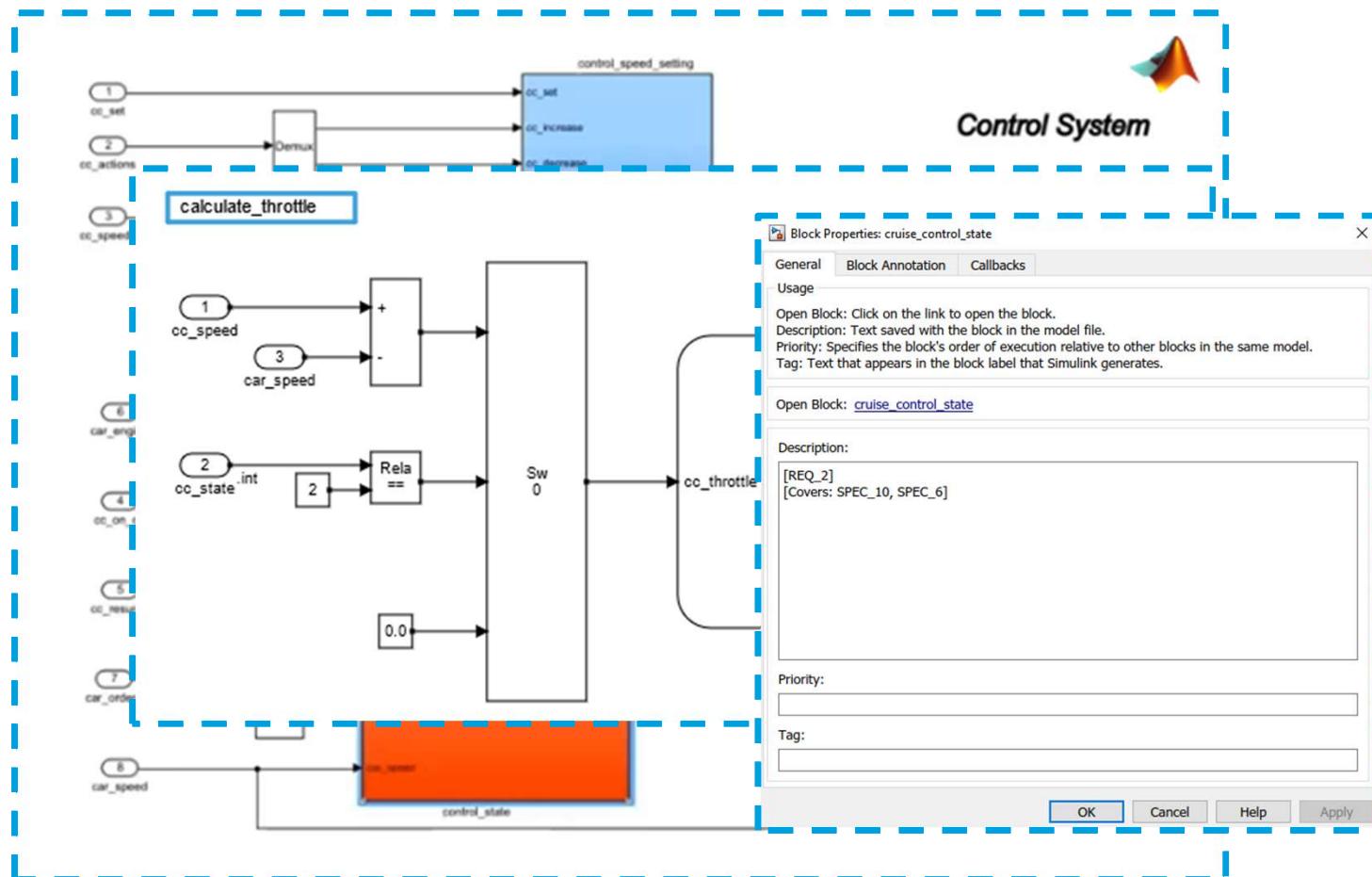
Ready

100%    

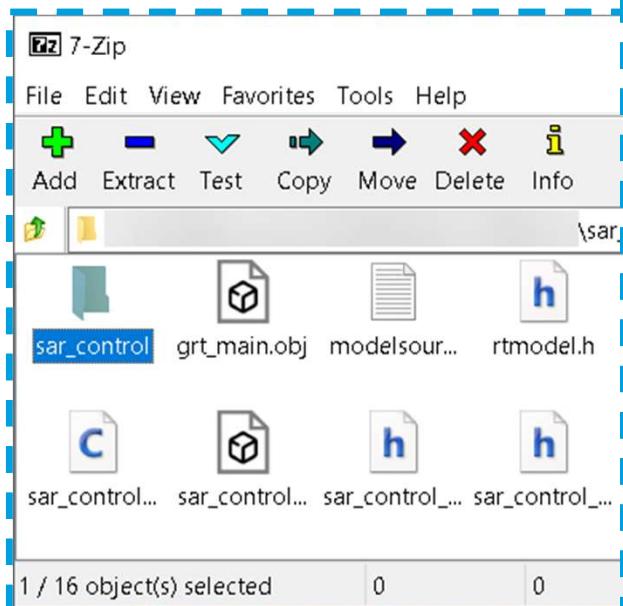
SOFTWARE ARCHITECTURE FOR SAR DRONE



SOFTWARE ARCHITECTURE FOR SAR DRONE



CODE FOR SAR DRONE



```
1  /*
2  * Real-Time Workshop code generation for Simulink model "SAR_control_r13_v0.n
3  *
4  * Model Version : 1.90
5  * Real-Time Workshop file version : 5.1 $Date: 2003/08/08 18:37:24 $
6  * Real-Time Workshop file generated on : Tue Jul 26 15:25:15 2005
7  * TLC version : 5.1 (Aug 8 2003)
8  * C source code generated on : Tue Jul 26 15:25:15 2005
9  */
10
11 // Implements REQ_1
12
13 #include <math.h>
14 #include <string.h>
15 #include "SAR_control_r13_v0.h"
16 #include "SAR_control_r13_v0_private.h"
17
18 /* Block signals (auto storage) */
19 BlockIO rtB;
20
21 /* Block states (auto storage) */
22 D_Work rtDWork;
23
24 /* External inputs (root import signals with auto storage) */
25 ExternalInputs rtU;
26
27 /* External output (root outports fed by signals with auto storage) */
28 ExternalOutputs rtY;
29
30 /* Parent Simstruct */
31 static rtModel_SAR_control_r13_v0 model_S;
32 rtModel_SAR_control_r13_v0 *const rtM_SAR_control_r13_v0 = &model_S;
33
34 /* Initial conditions for root system: '<Root>' */
35 void MdlInitialize(void)
36 {
37     // Implements REQ_4
38     /* Initialize code for chart: <S3>/cc_engine_state */
39
40     {
41         rtB.cc_engine = 0.0;
42     }
43 }
```

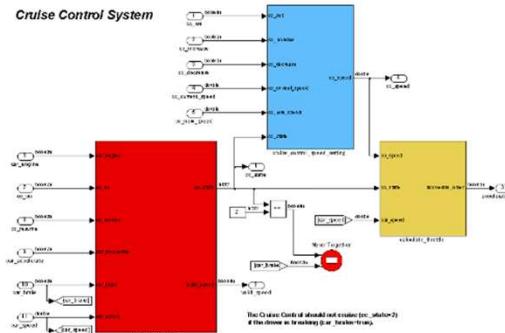
TESTS PLAN FOR SAR DRONE

Test Report



1. TEST OF PROPERTY 1

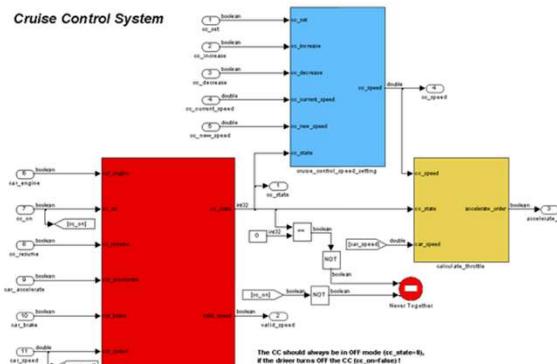
TESTProp



Covered Requirements : SR-1, SR-3

2. TEST OF PROPERTY 2

TESTProp2



Covered Requirements : SR-2

TEST RESULTS FOR SAR DRONE

SAR Tests Logs.txt - Notepad

File Edit Format View Help

=====

Verification report from XXX

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version 2021.03(Build R7085)

=====

Coverage report for: Tests Log Use project

Generated on: Tue Jun 3 16:56:06 2023

===== Statement =====

TESTProp1 : Tue Jun 3 16:56:06 2023 duration 0:01

==>Result : OK

TESTProp2 : Tue Jun 3 16:56:07 2023 duration 0:01

==>Result : OK

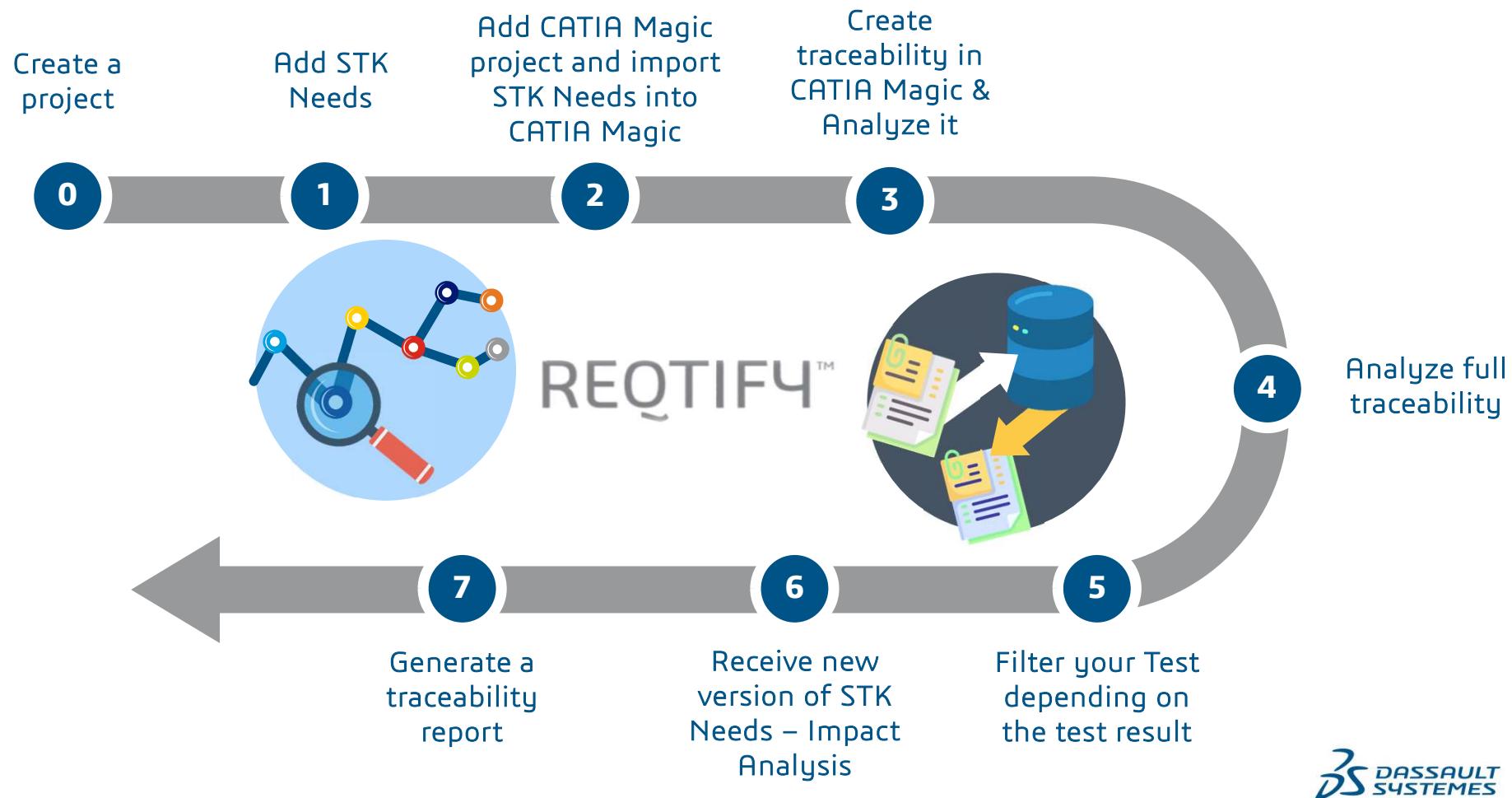
TESTProp3 : Tue Jun 3 16:56:08 2023 duration 0:01

==>Result : KO *****

TESTProp4 : Tue Jun 3 16:56:09 2023 duration 0:01

==>Result : KO *****

DEMO SCENARIO



CONCLUSION & TAKE AWAY

CONCLUSION & TAKE AWAY

- ✓ Traceability along entire system lifecycle.
- ✓ **Im/Export Capabilities** for better collaboration.
- ✓ **Non intrusive tool** : users stay in their legacy authoring environment.
- ✓ **Openness** : more than 100 connectors to commercial tools and standard formats.
- ✓ **Flexibility** : adapts to your own process.
- ✓ **Quick and Easy implementation & adoption.**
- ✓ Fast ROI.
- ✓ Compliant with safety standards: ISO26262, ARP4754A, DO178B/C...





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